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NEW CLAIMS

1. Membrane body (1), comprising at least a first panel (10) and a second panel (11) connected together in an adhesive manner by respective facing faces (12, 13) and a plurality of tie rods (16) arranged stably between the panels (10, 11) according to a set pattern; each said tie rod (16) having respective end portions (17, 18); said body further comprising insulation means (15) arranged between the panels and associated with each said tie rod (16) to leave said tie rod (16) longitudinally free between said panels (10, 11); said tie rod (16) being suitable for resisting a dual tensile membrane stress acting on each of said pair of panels (10, 11), and keeping said panels (10, 11) substantially free of tension during use; said second panel (11) covering said face (12) of said first panel (10) in such a way that said second panel (11) adheres integrally to said first panel (10).

2. Membrane body (1) as claimed in claim 1,

characterized in that

said insulation means (15) comprise a plurality of flexible sheaths (15) arranged between said

respective panels (10, 11) along force lines (F), each sheath housing a corresponding tie rod (16) in a longitudinally free manner.

3. Body according to claim 2,

characterised in that

said tie rod (16) comprises a plurality of fibres (24) free of at least a set material, that are arranged inside one said sheath (15) in such a way as to be longitudinally freely slideable.

4. Body according to claim 3,

characterised in that

said sheath (15) has an annular section.

5. Body according to claim 3,

characterised in that

said sheath (15) has an annular section interrupted at a first panel (10) (11) of the two said panels (10, 11).

6. Body according to claim 5,

characterised in that

said sheath (15) is longitudinally delimited by two respective strips (23) that are distinct from one another; said first panel (10) (11) being suitable, between the two said strips (23), for completing said annular section of said sheath (15), to limit the masses in play and increase their flexibility.

7. Body according to claim 5 or 6,

characterised in that

said sheath (15) and the respective said tie rod (16) comprise fibres (24) with a homogenous composition.

8. Body according to claim 5 or 6,

characterised in that

said sheath (15) and the respective said tie rod (16) comprise fibres (24) with a heterogeneous composition.

9. Body according to claim 5 or 6,

characterised in that

said tie rod (16) has fibres (24) with a homogenous composition.

10. Body according to claim 5 or 6,

characterised in that

said tie rod (16) has fibres (24) with a heterogeneous composition.

11. Body according to any preceding claim 7-10,

characterised in that

the fibres (24) of said sheath (15) and the fibres of the respective said tie rod (16) have sections with a substantially identical value.

12. Body according to any preceding claim 7-10,

characterised in that

the sections of the fibres (24) of said sheath (15) and those of the respective said tie rod (16) differ from one another by a set coefficient.

13. Body according to claim 12,

characterised in that

said coefficient falls within the range 0.20-5.

14. Body according to claim 12,

characterised in that

said coefficient falls within the range 0.5-2.

15. Body according to claim 12,

characterised in that

said coefficient falls within the range 0.75-1.5.

16. Body according to any preceding claim,

characterised in that

said first panel (10) (11) has a set shape, said two panels (10, 11) being connected together through adhesive covering material.

17. Body according to any preceding claim,

characterised in that

said free fibres (24) of each said tie rod (16) are organized in the form of roving.

18. Body according to any preceding claim,

characterised in that

said first panel (10) (11) of said pair of panels (10, 11) has a set shape, said two panels (10, 11) being connected together by covering adhesive material (2) suitable to react in a thermoplastic manner.

19. Body according to claim 18,

characterised in that

said sheath (15) has an annular section interrupted at a second (11) (10) panel of said pair of panels (10, 11); said second panel (11) (10) being a covering panel of said first panel (10) (11).

20. Body according to any preceding claim,

characterised in that

it comprises a plurality of pairs of panels (10, 11), each said pair of panels (10, 11) being delimited at the top and bottom by a first and by a second edge (6, 7).

21. Body according to any preceding claim,

characterised in that

said free fibres (24) are made from a material chosen from the following products Kevlar, Twaron, Dyneema, carbon, glass.

22. Body according to any preceding claim,

characterised in that

each said face (12) (13) has increased wettability through the application of a Corona treatment, or the like.

23. Sail (1)

characterised in that

it comprises at least one said membrane body (1) disclosed in claims 1-22, comprising at least one sailcloth (14), delimited by respective side edges (4, 5) converging in a peak (3), and by a base edge (7).

24. Awning for civil engineering purposes,

characterised in that

it comprises at least one said membrane body (1) disclosed in claims 1-22.

25. Method for the construction of membrane bodies as claimed in one of claims 1-22; said method comprising a phase of assigning a shape to at least a first adhesive panel (10) (11) of laminated material provided with at least an adhesive face (12) (13); a phase of applying a plurality of flexible longitudinal bodies (15) onto said first adhesive face (12) (13) according to a set pattern; a phase of protecting said flexible longitudinal bodies (15) with a second panel (11) (10); a phase of increasing the adhesive property of said first face (12) (13) of said first panel (10) (11) to fix in position said flexible longitudinal bodies (15) and said first and second panels (10) (11); wherein each said flexible

longitudinal body (15) is provided with insulation means (15) and inside said insulation means (15), with a tie rod (16) comprising a plurality of fibres (24) of a set composition to leave said tie rod (16) free to slide longitudinally in relation to its relative insulation means (15) and to said first panel and second panel (10, 11), and able to resist normal stress to free said two panels (10, 11) from membrane stress; said phase of protecting said flexible longitudinal bodies (15) comprising covering said first face (12) (13) of said first panel (10) with said second panel (11) (10) in such a way that said second panel adheres integrally to said first panel.

26. Method as claimed in claim 25 for the construction of membrane bodies as claimed in claims 1-22,

characterised in that

said phase of applying a plurality of flexible longitudinal bodies (15) onto said first adhesive face (12) (13) comprises applying a plurality of rovings (25) of free fibres (24) to said first face (12) (13) according to a set pattern and a phase of subdividing the free fibres (24) of said roving (25) into two distinct portions substantially coaxial to each other, to make a sheath (15) with a first portion of said free fibres (24) and a tie rod (16) with a second portion of said free fibres

(24); said sheath (15) being suitable for isolating said tie rod (16) from said first and second panels (10, 11), in such a way as to leave said tie rod (16) free to slide longitudinally in relation to said first panels and second panels (10, 11) and to resist normal stress to free said two panels (10, 11) from membrane stress.

27. Method according to claim 26,

characterised in that

the phase of protecting said roving (25), is followed by a phase of stably connecting together said first and second panels (10, 11) and of making stable the positioning of said rovings of free fibres (24) between said two panels (10, 11) in an adhesive manner through the application of pressure.

28. Method according to claim 27,

characterised in that

said phase of stably connecting said first and second panel (10) (11) is performed inside a vacuum bag through the delivery of heat.

29. Method for the construction of sails disclosed in claim 23 and comprising at least one sailcloth (14), delimited by respective side edges (4, 5) converging in a peak (3), and by a

base edge (7); comprising a phase of assigning a set shape to at least one first adhesive panel (10) (11) of laminated material and provided with a first adhesive face (12) (13); a phase of applying a plurality of rovings (25) of free fibres (24) to said first face (12) (13) according to a set pattern; a phase of protecting each said roving (25), by covering said first face (12) (13) of said first panel with a second panel in such a way that said second panel adheres integrally to said first panel and a phase of subdividing the free fibres (24) of said roving (25) into two distinct portions substantially coaxial to each other, to make a sheath (15) with a first portion of said free fibres (24) and a tie rod (16) with a second portion of said free fibres (24); said sheath (15) being suitable for isolating said tie rod (16) from said first and second panels (10, 11), in such a way as to leave said tie rod (16) free to slide longitudinally in relation to said first panels and second panels (10, 11) and to resist normal stress to free said two panels (10, 11) from membrane stress.

30. Method according to claim 29,

characterised in that

the phase of protecting said roving (25), is followed by a phase of stably connecting together said first and second panels (10, 11)

and of making stable the positioning of said rovings of free fibres (24) between said two panels (10, 11) in an adhesive manner through the application of pressure.

31. Method according to claim 30,

characterised in that

said phase of stably connecting said first and second panel (10) (11) is performed inside a vacuum bag through the delivery of heat.

32. Method according to any one of claims 25-31,

characterised in that

said phase of increasing an adhesive property of said first face (12) (13) is preceded by the phase of distributing an adhesive material (2) on said first face (12) (13).

33. Method according to any one of claims 26-32,

characterised in that

said phase of subdividing the free fibres (24) of said roving (25) into two parts to make a sheath (15) with a first portion of said free fibres (24) and a tie rod (16) with a second portion of said free fibres (24) is implementable through the delivery of heat to the adhesive material (2).

34. Method according to any one of claims 26-32,

characterised in that

said free fibres (24) are made from a material chosen from the following products Kevlar, Twaron, Dyneema, carbon, glass.

35. Method according to any one of claims 32-34,

characterised in that

said adhesive material (2) selectively comprises an acrylic or rubber resin compound or a copolymer similar to PET.

36. Method according to claim 35,

characterised in that

said acrylic compound is in the form of a gel.

37. Method according to any one of claims 29-36,

characterised in that

said phase of stably connecting said tie rods (16) to said first and second panels (10, 11) through respective end portions (17, 18) of said tie rods (16) is performed through heat.

38. Method according to any one of claims 29-36,

characterised in that

said phase of stably connecting said tie rods (16) to said first and second panels (10, 11) through respective end portions (17, 18) of said tie rods (16) is performed cold.